

SOV/180-59-3-21/43

AUTHOR: Kazarnovskiy, L.Sh., (Moscow)

TITLE: Permanent Magnets

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 3, pp 119-125(USSR)

ABSTRACT: This article is a fairly detailed review of the present level of Soviet permanent magnet technique; the different types of magnetic material are reviewed in turn. Martensitic steels are the oldest type of hard magnetic alloys, cobalt steels are hardly used in the USSR now because of their cost, tungsten-chrome and other steels are used. Alloys of the Fe-Ni-Al system are, throughout the world, the main materials for manufacture of permanent magnets. Triple alloys of these metals have been studied in great detail by A.S.Zaymovskiy, B.G.Livshits and V.S.Mes'kin, so that even before the war the mass production of cast magnets of these materials could be organised. Since then Soviet magnets of these materials have not been improved. Alloys of Fe-Ni-Al alloyed with 3-5% Cu, have various advantages over the triple alloys. A.A.Shekalov, T.Ye.Shtreys and A.Ya.Sochnev have developed alloys of

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increased copper content which have higher coercive force and magnetic energy than the older ones. Alloys of Fe-Ni-Al alloyed with silicon have been developed by Zaymovskiy, P.I. Denisov and Ye.S. Berkovich, they are known as "Alnisi". The magnetic properties were still further improved by alloying with titanium as suggested by S.I. Davidovich, B.V. Kuborskiy and P.T. Yeskevich. Alloys of Fe-Ni-Al and of Fe-Ni-Al-Cu may have additives to increase the strength, a small proportion of carbon is particularly helpful. Table 1 gives comparative values of magnetic properties of Soviet and foreign magnetic materials without cobalt. The difficulties in making an effective comparison are mentioned. However, it is evident that standard GOST 4402-48 does not correspond to modern requirements and should be tightened up. Isotropic alloys of Fe-Ni-Al alloyed with cobalt, copper and titanium (alnico) have well-known advantages. Development has followed the path of producing alloys of increased remanent induction and with higher coercive force. Table 2 gives data of Soviet and foreign alloys of this type. Anisotropic alloys based on Fe-Ni-Al-Co

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with additions of certain elements have numerous advantages. The method of improving the properties of permanent magnets of this kind by cooling in a magnetic field was developed by E.P.Komarovskiy. A number of Soviet and foreign anisotropic alloys are compared in Table 2. Brief reference is made to developments in the technology of casting magnets. Some factories are successfully making small magnets from cast blanks by spark machining. Metallo-ceramic magnets made of alloys of the Fe-Ni-Al system are briefly reviewed. Soviet industry has been manufacturing pressed magnets for about 10 years but the scale of production still does not satisfy requirements. The magnetic properties of modern pressed-magnets are given in Table 4. Although these magnets are not so good as cast magnets in some respects, they have numerous advantages. Various deformable alloys for permanent magnets are available and their main characteristics are given in Table 5. Magnets based on micro powders of iron were studied in the Scientific Research Institute of the Electrical Industry by A.S.Eysurovich and the magnetic properties of such magnets are given

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in Table 6. The properties of magnetically hard ferrites are discussed and the magnetic properties of magnets of barium-ferrite are given in Table 7. Because of their high temperature coefficients magnets of this material are generally used when great temperature stability is not required. This brief review reveals the remarkable developments in magnetically hard materials. Intensive research is required and its results should be reflected quickly in production so that Soviet industry disposes of magnets corresponding to modern requirements. There are 7 tables.

SUBMITTED: April 1, 1959

Card 4/4

KIFER, Isaak Iosifovich; KAZARNOVSKIY, L.Sh., red.; FRIDKIN, L.M.,
tekhn. red.

[Testing of ferromagnetic materials; magnetic measurements]
Ispytaniia ferromagnitnykh materialov; magnitnye izmereniia.
Izd.2., perer. Moskva, Gosenergoizdat, 1962. 543 p.

(MIRA 15:10)

(Magnetic materials--Testing)
(Magnetic measurements)

DRUZHININ, Vladimir Vyacheslavovich; KAZARNOVSKIY, L.Sh., kand. tekhn.
nauk, retsenzent; KROTOVA, L.I., red.; BUL'DYAYEV, N.A.,
tekhn. red.

[Magnetic properties of electrical steel]Magnitnye svoistva
elektrotekhnicheskoi stali. Moskva, Gosenergoizdat, 1962.
319 p. (MIRA 15:11)

(Steel--Magnetic properties)
(Electric engineering--Materials)

ZHERTVIN, Nikita Petrovich; TUNKOV, Vladimir Pavlovich; PERTSEV,
Mikhail Andreyevich; PAISOV, Aleksey Ivanovich; PCDVOYSKIY,
Lev Nikolayevich; KAZARNOVSKIY, L.Sh., red.; OZERETSKAYA, A.L.,
red. izd-va; KARASEV, A.I.; tekhn. red.

[Commercially pure iron] Tekhnicheski chistoe zhelezo. Moskva,
Metallurgizdat, 1962. 198 p. (MIRA 16:1)
(Iron)

DOVGALEVSKIY, Ya.M., kand. tekhn. nauk. KAZARNOVSKIY, L.Sh.,
kand. tekhn. nauk, retsenzent

[Cast magnets from magnesium-nickel-cobalt alloys] Lite
ratura iz splavov magnitnoy. Moskva, Mashinostroyeniye,
1964. 149 p. (MIRA 17:8)

BERGMAN, A.A.; ISAKOV, A.I.; MURIN, I.D.; SHAPIRO, F.L.; SHTRANIKH, I.V.;
KAZARNOVSKIY, M.V.

[Neutron spectrometer to measure retardation of neutrons in lead]
Neitronnyi spektrometr po vremeni zamedleniya neitronov v svintse;
doklady, predstavlenyye SSSR na Mezhdunarodnuyu konferentsiyu po
mirnomu ispol'zovaniyu atomnoi energii. Moskva, 1955. 30 p.
[Microfilm] (MLRA 9:3)

(Neutrons) (Spectrometry)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000721330004-1

True

APPROVED FOR RELEASE: 06/13/2000

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KAZARNOVSKIY, M.V.

MEZHL, Donald H., red.; KAZARNOVSKIY, M.V. [translator]; TIKHOMIROV, F.A. [translator]; ARNOL'D, N.A. [translator]; PETRUKHIN, V.I. [translator]; MATSONASHVILI, B.N. [translator]; AKSENOV, S.I. [translator]; BAKANOV, S.P. [translator]; SHAPIRO, I.S., red.; ADIROVICH, E.I., red.; MEDVEDEV, Yu.T., red.; NAKHIMSON, I.G., red.; TELESNIN, N.L., red.; BELEVA, M.A., tekhn.red.

[Fundamental formulas of physics. Translated from the English]
Osnovnye formuly fiziki. Moskva, Izd-vo inostr. lit-ry, 1957.
657 p. (MIRA 11:5)

(Mathematical physics)

FOR NEWSLEY MIV

56-6-45/47

AUTHOR: Kazarnovskiy, M. V.

TITLE: The Spatial-Energetic Distribution of Neutrons in a Heavy Gaseous Moderator (Prostranstvenno-energeticheskoye raspredeleniye neytro-nov v tyazhelom gazoobraznom zamedlitele)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1957, Vol. 33, Nr 6(12), pp. 1533 - 1535 (USSR)

ABSTRACT: The theory of the thermalization of neutrons in a heavy monoatomic gas (mass number $\gg 1$) with constant free path λ and constant life τ of neutrons was already investigated in some previous works (references 1, 2, 3). However, most results determined concern only energy distribution. The function of the spatial-energetic distribution has hitherto been determined only within the domain of comparatively high energies (reference 2). In the case of weak capture this problem can be rigorously solved. First the equation for the function of spatial-energetic distribution is written down. If moderators with finite dimensions are used, the solution of the aforementioned equation can be set up in form of a development in series (according to a complete system of orthonormalized functions) of the Laplacian for the respective boundary

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KAZARNOVSKIY, M. V., STEPANOV, A. V. and SHAPIRO, F. L.

"Thermalization and Diffusion of Neutrons in Heavy Media."

paper to be presented at 2nd UN Intl. Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sept 58.

AUTHOR: Kazarmovskiy, M.V.

SOV/ 89-4-6-5/30

TITLE: The Energy Distribution of Neutrons From a Pulsed Source in a Heavy Moderator With Constant Free Length of Path
(Energeticheskoye raspredeleniye neytronov ot impul'snogo istochnika v tyazhelom zamedlitеле s postoyannoy dlinoy svobodnogo probega)

PERIODICAL: Atomnaya energiya, 1958, Vol. 4, Nr 6, pp 539-546 (USSR)

ABSTRACT: Theoretically an expression for the energy distribution of neutrons from a pulsed source in a heavy moderator (mass number $M \gg 1$) with constant free length of path l is derived within an energy range that is small compared to the initial energy. The energy distribution has the following shape:

$$\text{const exp} \left\{ \frac{1+M}{2} f_{-1}(z) + f_0(z) + \frac{2}{M+1} f_1(z) + \dots \right\}$$

where $z = \frac{M+1}{v \cdot t}$, v - velocity of neutrons, t - moderation time.

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For the functions $f_0(z)$, $f_1(z)$, $f_{-1}(z)$ an integral-like representation (analytical representation is given near the maximum)

The Energy Distribution of Neutrons From a Pulsed Source in a SOV/89-4-6-5/30
Heavy Moderator With Constant Free Length of Path

and an asymptotic development are given. The corresponding numerical values are tabularized. Numerical evaluation shows that by means of these formulae it is possible to describe also the neutron spectrum in a moderator that is as light as deuterium. Also the case is dealt with in which the moderator consists of different kernels. For the solution of this problem a method was developed for integral and integral-differential equations, viz. for nuclei $K(x,y)$, which are different from 0 only for very low values of the order

$$|x-y| \leq |x+y|$$

In the appendix it is shown that by the method recommended it is possible to solve also an equation of the general type:

$$\sum_{m=0}^n \eta_m \varphi_m(x, \eta) \frac{d^m y(x)}{dx^m} = \frac{1}{\eta} \int_{x-\eta q_2(x, \eta)}^{x+\eta q_1(x, \eta)} dx' y(x') K(x, x', \eta)$$

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The Energy Distribution of Neutrons From a Pulsed Source in a SOV/89-4-6-5/30
Heavy Moderator With Constant Free Length of Path

where $\varphi_m(z, \eta)$ and $q_1(z, \eta)$ are finite with $\eta \rightarrow 0$. There are
3 figures, 1 table and 10 references, 3 of which are Soviet.

SUBMITTED: November 12, 1957

- | | |
|----------------------|------------------------------------|
| 1. Neutrons--Energy | 2. Neutrons--Mathematical analysis |
| 3. Neutrons--Sources | 4. Neutron absorbers--Theory |

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PHASE I BOOK EXPLOITATION

SOV/3271
SOV/5-M-11

Akademiya nauk SSSR. Fizicheskiy institut imeni P. N. Lebedeva

Issledovaniya po optike i yadernoy fizike (Research in Optics and Nuclear Physics) Moscow, Izd-vo AN SSSR, 1959. 223 p. (Series: Its Trudy, t. 9) Errata slip inserted. 1,700 copies printed.

Ed.: D. V. Skobel'tsyn, Academician; Ed. of Publishing House: D. M. Alekseyev; Tech. Ed.: G. A. Astaf'yeva.

PURPOSE: This series of articles is intended for specialists in optics and nuclear physics.

COVERAGE: The first of these articles deals with the many different causes of the broadening of the spectral lines of various light sources and research on the form and width of spectral lines in a d-c electric arc. Recombination luminescence and coloration of the KCl-Tl phosphor are discussed in the second paper. The third paper is on the determination of the effective capture and recombination cross sections in crystal phosphors, and the fourth deals with the theory of nonstationary elastic deceleration of neutrons in a heavy medium. References accompany each article.

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Research in Optics and Nuclear (Cont.)
APPROVED FOR RELEASE: 06/13/2000

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TABLE OF CONTENTS:

Kitayev, V.F. Investigation Into the Form and Width of Spectral Lines in a D-C Electric Arc.

This article discusses natural and Doppler broadening of the spectral lines as a result of the interaction of the irradiated atom with particles of the surrounding medium, the quantum theory of the broadening of spectral lines, experimental research on the form and width of spectral lines, the problem of emission spectral lines in general and emission spectral lines in an electric arc in particular. Part II of the article discusses the setting up of the experiment, the excitation source, the optical system of the experimental apparatus, the resolution of the photographic plates, taking and processing spectrograms, and experimental results. Part III discusses interaction constants for the sodium lines investigated, line broadening due to Van der Waals forces and the Stark quadratic effect, density of charged particles in an arc, comparison of experimental results with data from statistical theory, and evaluation of the Stark effect constants from the measurement of the half-width of spectral lines in an electric arc.

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Research in Optics and Nuclear (Cont.)

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also discusses the energy yield of F-center formation in KCl-Tl and KCl-Ag under gamma excitation.

Hsi Hsi-yung. Determination of the Effective Electron Capture Cross Section and Recombination Cross Sections in Phosphor Crystals 125

This is a dissertation presented for the degree of Candidate of Physical and Mathematical Sciences. In Part I the author discusses the luminescence of phosphor crystals and current conceptions of the kinetics of luminescence, the rise and extinguishment of luminescence, the effect of temperature on luminescence, sensitivity of phosphors to infrared rays, the fluorescent effect of exciting light, and the kinetics of phosphorescence. Part II deals with the effective capture and recombination cross sections for the phosphor ZnS-Cu,Co, measurement of the light sum by the method of thermal irradiation excitation, determination of the relation between the effective capture cross section and the recombination cross section of thermal electrons from the thermal irradiation excitation curves, determination of the relation of the effective capture cross section to the recombination cross section of optical and thermal electrons from the attenuation curves, determination of the ratio $\frac{\sigma_e}{\sigma}$ for optical electrons.

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5-5-60

21 (0)

AUTHOR:

Kazarnovskiy, M.

SOV/48-23-7-27/31

TITLE:

On the Moments of Inertia of Atomic Nuclei (O momentakh inertsii atomnykh yader)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 912-913 (USSR)

ABSTRACT:

In the introduction, it is ascertained that the fact that a nucleus can move like a system of poorly interacting particles has not as yet been investigated. It is pointed out that the wave function for states in which the life of the rotational state of a nucleus is short as against the time necessary for the transmission of motion from one part of the nucleus to another, is no genuine wave function. It is then pointed out that the probable moment of inertia I is composed of the moment of inertia I_1 of the outer shell, and the moment of inertia I_0 of the core of the nucleus. The formulas for both moments of inertia are derived, and under consideration of the deformation caused by the internal quadrupole moment, formula (2) is set up for the calculation of the moment of inertia of the nuclei. A table indicates the experimental and theoretical values of the

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On the Moments of Inertia of Atomic Nuclei

SOV/48-23-7-27/31

Moments of inertia of even-even nuclei, which show a satisfactory agreement. Finally, it is ascertained that the model introduced here is not capable of clarifying why the moments of inertia of odd nuclei deviate by about 20 %. The author thanks A. S. Davydov, D. A. Zaikin, I. M. Frank, Yu. K. Khokhlov and F. L. Shapiro for the discussion he had with them. There are 1 table and 3 references, 1 of which is Soviet.

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845.9

S/056/60/038/005/057/057/XX
B006/B070

24.7200

AUTHOR:

Kazarnovskiy, M. V.

TITLE:

The Theory of Resonance Interaction of Gamma Quanta in Crystals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp 1652 - 1654

TEXT: Mossbauer has shown that in the expression for the probability of an elastic resonance interaction between gamma quanta and nuclei in a crystal, there occurs the factor $f = \exp[g_{\infty}(T)]$, where

$$g_{\infty}(T) = -2 \sum_s \frac{(\vec{p} \vec{e}_s)^2}{2m \hbar \omega_s N} \left[\alpha \left(\frac{\hbar \omega_s}{kT} \right) + \frac{1}{2} \right], \quad \alpha(x) = 1/(e^x - 1)$$

(\vec{p} - momentum of the quantum, T - temperature of the crystal, m - mass of the atoms of the crystal, N - their density, \vec{e}_s and ω_s - polarization and frequency, respectively, of the s-th photon in the crystal). It is now shown that if no correlation exists between the directions of \vec{e}_s and ω_s .

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The Theory of Resonance Interaction of Gamma
Quanta in Crystals

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B006/B070

$g_{\infty}(T)$ can be calculated directly and more precisely from measurements of C_v . It is found that $g_{\infty}(T) = -(E^2/2mc^2) \cdot [C_v - G_1(T)]$. $E = pc$;

$G_0 = \int_0^{\infty} \frac{d\omega}{\hbar\omega} \nu(\omega)$, $G_1(T) = 2 \int_0^{\infty} \frac{d\omega}{\hbar\omega} \nu(\omega) \alpha\left(\frac{\hbar\omega}{kT}\right)$. It is further found that

$G_0 = (\pi k)^{-2} \int_0^{\infty} C_v(T) dT/T^2$, and it is shown that

$G_1(T) = \frac{2}{3} k^{-2} \sum_{n=1}^{\infty} \int_0^{T/n} \frac{dT'}{T'^2} \left(\frac{1}{T'} - \frac{n}{T} \right) \psi(T')$, $\psi(T) = \sum_{n=1}^{\infty} \mu_n \int_0^{T/n} C_v(T') dT'$, where

$\mu_1 = 1$, $\mu_{n \neq 1} = (-1)^1$, where n is the product of 1 different integers; in all other cases $\mu_n = 0$. $\nu(\omega)$ is the frequency spectrum of the natural lattice vibrations. From the C_v data of Ir^{191} ($E = 29 \text{ kev}$) and Zn^{67} ($E = 93 \text{ kev}$), $g_{\infty}(0)$ was calculated to be 2.75 and 5.6, respectively

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The Theory of Resonance Interaction of Gamma Quanta in Crystals S/056/60/038/005/057/057/XX
B006/B070

From experiments on the gamma resonance interaction of Ir^{191} , $g_{\infty}(0)$ was found to be -3.0 ± 0.3 . A. V. Stepanov and F. L. Shapiro are thanked for discussions. There are 6 references: 2 Soviet, 3 German, and 1 US.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P. N. Lebedev of the Academy of
Sciences USSR)

SUBMITTED: March 28, 1960

Card 3/3

KAZARNOVSKIY, M.V.; SHAPIRO, F.L.

[Thermal neutron diffusion theory with allowance for
velocity distribution] Teoriia diffuzii teplovykh
neitronov s ucheto~~m~~ raspredeleniia skorostei. Moskva,
Glav. upr. po ispol'zovaniyu atomnoi energii, 1960. 14 p.
(MIRA 17:2)

84408

26.2240
24.6510

S/056/60/039/004/026/048
B006/B063

AUTHORS: Kazarnovskiy, M. V., Stepanov, A. V.

TITLE: Elastic Resonance Scattering of Slow Neutrons in Crystals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 39, No. 4(10), pp. 1039 - 1041

TEXT: The present paper gives formulas for differential elastic resonance scattering cross sections of slow neutrons in crystals. The authors confined themselves to nuclei having levels of resonance energies \leq ev and a relatively high ratio of neutron width to total level width (≥ 0.1), such as Xe¹³⁵, Yb¹⁶⁸, Tm¹⁶⁹, Hf¹⁷⁷, Re¹⁸⁵, Au¹⁹⁷, and Pu²⁴⁰. First, a formula that is exact up to a trivial constant factor is given for the elastic resonance scattering probability of neutrons in a crystal, neglecting the total resonance level width Γ of the quantum state of the lattice. Using the results of Lamb (Ref. 1), a few other expressions are given, which are further treated in Debye approximation.

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Elastic Resonance Scattering of Slow Neutrons S/056/60/039/004/026/048
in Crystals B006/B063

Thus, $P = \int_0^{\infty} dt \exp\left\{it\left(\frac{p^2}{2m} - E_0\right) - \frac{1}{2}\Gamma t + g(t)\right\}$, and the mean square $\overline{|P|^2}$ in Debye approximation has the form $\overline{|P|^2} = 2\pi a^{-2} \exp\{2\text{Re}f(t_0)\}$, $a^2 = |d^2g(t)/dt^2|_{t=t_0}$, where t_0 is the value of t corresponding to the maximum of the function $f(t) = g(t) + it(p^2/2m - E_0) - \Gamma t/2$. The two special cases $T \gg \theta$ (θ - Debye temperature) and $T = 0$ are considered. For the two cases, the authors give expressions for $g(t)$ and determine $f(t_0)$.

F. L. Shapiro is thanked for discussions. There are 3 references:
1 Soviet, 1 US, and 1 German.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P. N. Lebedev of the Academy of
Sciences USSR)

SUBMITTED: May 3, 1960 (initially) and July 28, 1960 (after revision)

Card 2/2

S/638/61/001/000/014/056
B101/B102

AUTHORS: Kazarnovskiy, M. V., Stepanov, A. V.
TITLE: Neutron thermalization. (A review paper)
SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu
atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961.
107-117

TEXT: This is a report on the development of research into the interaction of neutrons with matter since 1936 (Fermi). Such subjects as interactions between neutrons and atoms, molecules, crystals and liquids are briefly dealt with as well as the multiple scattering of neutrons in matter taking account of the chemical bond and of the atomic thermal motion, and also an approximate representation of neutron thermalization in a heavy gas. Experiments conducted at FIAN are mentioned. S. I. Drozdov, D. F. Zaretskiy, and F. L. Shapiro (Reports at the Second Geneva Conference on the Peaceful Uses of Atomic Energy) are referred to. There are 2 figures and 47 references: 6 Soviet and 41 non-Soviet. The four most recent

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Neutron thermalization. (A review paper) S/638/61/001/000/014/056
B101/B102

references to English-language publications read as follows: Brockhouse B. N., Phys. Rev. Lett., 2, 256, 1959; Palevsky H., Hughes D. J., Kley W., Tunkelo E., Phys. Rev. Lett., 2, 258, 1959; Chose A., Palevsky H., Hughes D. J., Polah I., Eisenhower C. M., Phys. Rev., 113, 49, 1959; Brockhouse, B. N., Phys. Rev. Lett., 2, 287, 1959.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR
(Physics Institute imeni P. N. Lebedev of the AS USSR)

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38150

S/058/62/000/004/031/160

A058/A101

26.2241

AUTHORS: Kazarnovskiy, M. V., Shapiro, F. L.

TITLE: The theory of thermal neutron diffusion taking velocity distribution into account

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 60, abstract 4B453
(V sb. "Neytron. fizika". Moscow, Gosatomizdat, 1961, 169 - 178)

TEXT: There was worked out a general approach to the construction of a theory of diffusion with many velocity groups of neutrons. The authors used Laguerre polynomial expansion of neutron density into a series, the i-th term of the series being considered as the i-th neutron group. The method is appropriate for cases when the energy of the neutrons emitted by sources is close to thermal, or the energy spectrum of the neutrons of the source is not very essential (e.g., cases of diffusion of neutrons far from the source in stationary problems, or at long times from the moment of pulse in the case of pulse sources). The authors examine the application of two- and three-group approximations of the resultant system of equations. It is shown that taking into account the velocity distri-

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The theory of thermal...

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A058/A101

bution of neutrons in a diffusion approximation leads to the following effects:
1) a dependence of mean neutron velocity on the size of the system and on other diffusion conditions, and 2) minor corrections in slowing-down times and relaxation lengths of neutron density. Some applications of the obtained results are considered: a pulse source in a limited medium, a stationary source in an infinite medium with a heavy, gaseous moderator. In addition to multivelocity corrections, it is necessary to take into account nondiffusion corrections.

B. Kochurov

[Abstracter's note: Complete translation]

Card 2/2

S/056/62/042/002/029/055
B108/B104

26 2242
AUTHORS: Kazarnovskiy, M. V., Stepanov, A. V.
TITLE: Theory of resonance scattering from atomic systems. I.
General formulas
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
no. 2, 1962, 489 - 498

TEXT: The authors derived general formulas for the probabilities of resonance and interference scattering. Under the assumption that an excitation (gamma absorption or neutron capture) does not affect the motion of the center of gravity of the scattering atoms, and that energy and width of the excited level are independent of atomic number and spin projection of the excited nuclei, the total probability of resonance scattering is

$$W(p_i, p_f) = 2\pi A \sum_j W_{ij}(p_i, p_f) + 2\pi B \sum_j W_{ji}(p_i, p_f),$$

$$W_{ij}(p_i, p_f) = \sum_{m_i} \sum_{m_f} K_{m_i m_f} \sum_{m_A} (E_i - E_0 - E_{m_A} + \frac{1}{2} (H)^{-1} \times \quad (1)$$

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S/056/62/042/002/029/05
B108/B104

Theory of resonance scattering...

The physical meaning of the correlation function $Z_{\nu\nu'}$ can be seen from

$$\Gamma_w(R_1, R_2, \mu, t, t') = (2\pi)^{-3} \int d\mathbf{p}_i d\mathbf{p}_f Z_w(\mathbf{p}_i, \mathbf{p}_f, \mu, t, t') e^{i\mathbf{R}_1 \cdot \mathbf{p}_i - \mathbf{R}_2 \cdot \mathbf{p}_f} \quad (12)$$

$$Z_w(\mathbf{p}_i, \mathbf{p}_f, \mu, t, t') = \int d\mathbf{R}_1 d\mathbf{R}_2 \Gamma_w(\mathbf{R}_1, \mathbf{R}_2, \mu, t, t') e^{i\mathbf{R}_1 \cdot \mathbf{p}_i - \mathbf{R}_2 \cdot \mathbf{p}_f} \quad (13)$$

which equations show that $\Gamma_{\nu\nu'}$ determines the spatial correlation of the ν -th and the ν' -th particle at four different instants of time. Interference of resonance and potential scattering can be taken into account by adding to the resonance scattering probability a term of the form

$$W_{int}(\mathbf{p}_i, \mathbf{p}_f) = 4\pi \operatorname{Re} \left\{ A' \sum_{\nu} v_{\nu\nu}(\mathbf{p}_i, \mathbf{p}_f) + B' \sum_{\nu \neq \nu'} v_{\nu\nu'}(\mathbf{p}_i, \mathbf{p}_f) \right\}, \quad (23)$$

$$\text{with } v_{\nu\nu'}(\mathbf{p}_i, \mathbf{p}_f) = -i(2\pi)^{-1} \int_{-\infty}^{\infty} d\mu \int_0^{\infty} dt Z_{\nu\nu'}(\mathbf{p}_i, \mathbf{p}_f, \mu, t, 0) \times \quad (24)$$

$$\times \exp \{ i\mu(E_{p_i} - E_{p_f}) + i t(E_{p_i} - E_0 + \frac{1}{2} i\Gamma) \},$$

Card 3/4

Theory of resonance scattering...

8/056/62/042/002/027/055
B108/B104

In a subsequent paper the results of this work are to be applied to some simple models of the motion of the scatterer atoms. Mention is made of A. Aklonis, I. Pomeranchuk (J. Phys. USSR, 11, 167, 1947), I. P. Dzyub, A. F. Lubchenko (FTT, 3, 2275, 1961; Izv. AN SSSR, seriya fiz., 25, 901, 1961). There are 22 references: 7 Soviet and 15 non-Soviet. The four most recent references to English-language publications read as follows: P. Schofield. Phys. Rev. Lett., 4, 239, 1960; K. S. Singwi, A. Sjölander. Phys. Rev., 120, 1093, 1960; G. Baym. Phys. Rev., 121, 741, 1961; M. V. Kazarnovskiy, A. V. Stepanov. Inelastic scattering of neutrons in solids and liquids, Intern. Atomic Energy Agency, Vienna, 1961, p. 87. ✓

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Physics Institute imeni P. N. Lebedev of the Academy of
Sciences USSR)

SUBMITTED: July 31, 1961

Card 4/4

KAZARNOVSKIY, M.V.; STEPANOV, A.V.

Theory of resonance scattering on atomic systems. Acta phys Hung
14 no.1:45-66 '62.

1. Fizicheskiy Institut im. P.N. Lebedeva AN SSSR, Moskva, SSSR.
Predstavleno Albert Konya.

KAZARNOVSKIY, M.V.; STEPANOV, A.V.

"Observed" probabilities of elastic neutron scattering and the Mossbauer effect in degenerated systems, and some new possibilities for producing such systems. Zhur.eksp.i teor.fiz. 43 no.6: 2299-2301 D '62. (MIRA 16:1)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.
(Neutrons--Scattering) (Mossbauer effect) (Quantum theory)

ACCESSION NR: AP4042382

S/0056/64/047/001/0139/0146

AUTHORS: Kazarnovskiy, M. V.; Stepanov, A. V.

TITLE: Elastic scattering of neutrons and the Mossbauer effect in systems with local degrees of freedom

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 139-146

TOPIC TAGS: neutron scattering, energy level, Mossbauer effect, temperature dependence, correlation statistics, krypton

ABSTRACT: It is shown that additional valuable information on the energy levels corresponding to the local degrees of freedom, and particularly their lifetime, can be obtained from an analysis of elastic (more precisely, quasielastic) scattering of neutrons. The possibilities are discussed of investigating these lifetimes and the laws of motion relative to local degrees of freedom by quasielastic incoherent scattering of slow neutrons and also by the Mossbauer

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ACCESSION NR: AP4042382

effect. It is shown, in particular, that under conditions of "poor resolution" the dependence of the probabilities for these effects on momentum transfer and on the temperature of the medium differs essentially from that of a system without local state. It is demonstrated that the cross section for quasielastic scattering of neutrons should depend significantly on whether local degrees of freedom are or are not present. The magnitude of the effect, as expressed by the ratio of the correlation functions, amounts to 0.2 as determined by neutron scattering and 0.5 as determined by the Mossbauer effect. It is pointed out that at large momenta, the probability may even increase with temperature. This effect may explain the peculiar temperature dependence of the Mossbauer effect on krypton embedded in organic compounds (Hazoni et al., Physics Letters, 2, 337, 1962). The practical difficulties of observing the peculiarities in the temperature behavior of the correlation function when local degrees of freedom are present are discussed. "The authors are deeply grateful to F. L. Shapiro for continued interest

2/3

ACCESSION NR: AP4042382

and to M. A. Krivoglaz and A. A. Maradudin for helpful discussions."
Orig. art. has: 3 figures and 18 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk
SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 30Oct63

ENCL: 00

SUB CODE: NP

NR REF SOV: 003

OTHER: 004

3/3

ACCESSION NR: AP4043629

S/0056/64/047/002/0543/0557

AUTHORS: Kazarnovskiy, M. V.; Stepanov, A. V.

TITLE: The time correlation function method and its application to the theory of Mossbauer line shift and deformation

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 543-557

TOPIC TAGS: Mossbauer effect, excited state, correlation technique, radiation effect theory, time correlation, line shift

ABSTRACT: The interaction between radiations of arbitrary type (particles, quanta) with complex systems (molecules, liquids) is analyzed in order to ascertain what information concerning the structure and dynamics of the complex system can be obtained from an analysis of the data obtained by sounding the system with radiation and, conversely, what characteristic of the complex system must be known in order to predict the results of such an action. Starting

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ACCESSION NR: AP4043629

with the van Hove expression for the differential scattering cross section

$$\frac{\partial^2 \sigma}{\partial E \partial \Omega} \propto \int_{-\infty}^{\infty} \exp\left(-\frac{i}{\hbar} t \Delta E\right) K(t) dt,$$

where $K(t)$ is the statistical and quantum mechanical mean of an operator $T^+(t)T(0)$ and ΔE -- energy transfer, it is shown here that (1.1) is a general formula and different types of sounding particles and their interaction with the system differ only in the concrete form of the operator $T(t)$. Each such operator is regarded as a dynamic variable characterizing the investigated system. The corresponding function $K(t)$ is the time correlation function of this dynamic variable. The types of the operator $T(t)$ for different particular cases are considered. By way of an example, the shift and deformation of a Mossbauer line due to the difference in the Hamiltonians of the atomic motion, when the Mossbauer nucleus is in the ground state and in the excited state. Integral relations connecting the

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ACCESSION NR: AP4043629

Mossbauer probability (as a function of the temperature) with the shape of the Mossbauer line are obtained. It is shown that when there are discrete degrees of freedom, the Mossbauer line will not only shift but will also be greatly distorted. Some possible applications of the time correlation function technique are discussed. Orig. art. has: 49 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 10Jan64

ENCL: 00

SUB CODE: NP

NR REF SOV: 006

OTHER: 011

Card 3/3

L 1981-66 EWT(m)/T/EWA(m)-2

ACCESSION NR: AT5018598

UR/2504/65/033/000/0203/0234

AUTHOR: Kazarnovskiy, M. V.; Stepanov, A. V. 44,55

TITLE: Method of temporal correlation functions in the description of interactions of various particles with a complex system, and its applications

SOURCE: AN SSSR. Fizicheskiy institut. Trudy, v. 33, 1965. Issledovaniye atomnogo yadra s pomoshch'yu zaryazhenykh chastits i neytronov (Investigation of the atomic nucleus using charged particles and neutrons), 203-234

TOPIC TAGS: correlation function, particle interaction, differential cross section, scattering cross section

ABSTRACT: The expression first derived by L. Van Hove (Phys. Rev. v. 95, 249, 1954) for the differential cross section of the scattering of particles or light quanta by a more complicated system (molecule, crystal), in terms of space-time pair correlation functions, is universal and applied to all kinds of interacting particles and systems, differing only in the interaction operator, which can be regarded as a dynamic variable characterizing the studied system. A formalism is developed which makes it possible to express in terms of certain temporal correlation functions (TCF) the probabilities of interaction of arbitrary incident particles or radiation with the system under investigation. Relations are established

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L 1981-66

ACCESSION NR: AT5018598

3
between the TCF corresponding to different types of variables and different interactions, and their general behavior for long and short time intervals is investigated. It is shown that the TCF should in general be complex, and the vanishing of the complex part signifies an approach to the classical limit and neglect of recoil effects. If the system in question is in thermal equilibrium, then the real and imaginary parts of the TCF are connected by relations that are derivable from Nuyquist's fluctuation-dissipation theorem. The particular case of a system whose degrees of freedom can be separated into fast (ballistic) and slow (adiabatic) components and the particles interact only with the ballistic component is considered. The formalism is expanded to include the case when the damping of the initial state is significant. Other particular cases studied are the shift and deformation of the Mossbauer line resulting from the difference in the Hamiltonians of the atomic motion when the Mossbauer nucleus is in the ground and excited states, respectively, the scattering of ultracold neutrons in inhomogeneous media, and resonant scattering of slow neutrons and γ quanta in atomic systems describable by simple models. The advantages of the proposed formalism and further applications are discussed briefly in the conclusion. "The authors thank D. A. Krizhnits for useful discussions." Orig. art. has: 115 formulas. 99,55

Card 2/3

L 1981-66

ACCESSION NR: AT5018598

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute, AN SSSR) 84,55 3

SUBMITTED: 00

ENCL: 00

SUB CODE: NP

NR REF SOV: 009

OTHER: 012

KC
Card 3/3

KAZARNOVSKIY, M.V.; FOPOV, Yu.P.; GADIKOV, I.F.

Research with the aid of pulsed neutrons. Atom. energ. no.4:
408-410 0 '65. (MIRA 18:11)

KAZARNOVSKIY, N. A.

AUTHOR: Malyusov, V. A.

64-1-18/19

TITLE: Scientific Conference at the Institute for Physical
Chemistry Imeni L. Ya. Karpov
(Nauchnaya konferentsiya v Fiziko-khimicheskom institute
imeni L. Ya. Karpova)

PERIODICAL: Khimicheskaya Promyshlennost', 1958, Nr 1, pp. 56-56 (USSR).

ABSTRACT: At the end of November, 1957, a meeting of the scientific
session of the scientific council took place in the above
mentioned institute in honour of the 40th anniversary of the
great socialist October Revolution. 19 contributions of the
most interesting works carried out of lately in this institute
were delivered. The corresponding member of the AN USSR, pro-
fessor S. S. Medvedev, gave a report on the investigation of
the general rules governing the emulsion polymerization. The
active member of the AN USSR, professor V. A. Kargin reported
on new observations in structural polymers. The corresponding
member of the AN USSR, professor K. A. Kocheshkova reported
on investigations in the field of organic lithium compounds.
The corresponding member of the AN USSR, N. A. Kazarnovskiy.

Card 1/3

Scientific Conference at the Institute for Physical
Chemistry Imeni L. Ya. Karpov

64-1-18/19

reported on peroxide compounds of the alkaline metals, professor A. I. Shtatenshteyn on the isotopic reactions with deuterium in anhydrous solutions, professor P. P. Shorygin on the interaction of the substituents in molecules of organic compounds, D. N. Shirogin on the nature and effect of the hydrogen- and metal element binding, professor B. F. Ormont on the importance of the solid phases, professor G. S. Zhdanov reported on the work of the electronic computing machine "Kristall" and demonstrated it. V. L. Karpov reported on the investigations of the radiation stability of high polymers, professor V. I. Veselovskiy on the mechanism of the radiation-electrochemical processes, professor M. A. Proskurnin on the sensitization of radiation-chemical reactions, professor S. Ya. Pshchetskiy on the oxidation of nitrogen under ionizing radiations, professor N. N. Tunitskiy on the molecule- and ionic dissociation in the mass spectrometer, A. Kh. Breger on sources of nuclear radiations, professor Ya. M. Kolotyркиn on electrochemical investigations of metals, the corresponding member of the AN USSR professor N. M. Zhavoronkov reported on the process of steady and unsteady mass transport in the absorption and rectification, professor

Card 2/3

Scientific Conference at the Institute for Physical
Chemistry Imeni L. Ya. Karpov.

64-1-18/19

M. I. Frankin and L. E. Apel'baum on the chain characteristics
of heterogeneous catalytic reactions and professor G. K. Borekov
reported on: "Some Questions of Catalyst Selection."
There are no references.

AVAILABLE: Library of Congress.

1. Chemical research-USSR
2. Scientific research-USSR

Card 3/3

KAZARNOVSKIY, R.N., inzhener.

Precast concrete elements for sloping roofs. Biml. stroi. tekhn.
13 no.6:18-20 Ja '56. (MLRA 9:9)

1. Mosstroyekt.

(Roofs)

L 35541-65 EWT(m)/EWA(d)/T

ACCESSION NR: AP5008103

S/C286/65/000/005/0058/0058

AUTHORS: Ivanov, G. S.; Kogan, P. S.; Kazarnovskiy, S. N.; Bodrikov, I. V.;
Timoshenko, Z. F.; Matuzova, L. S.

TITLE: A method for producing nonionogenic surface active substance. Class 23.
No. 168832 15

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 5, 1965, 58

TOPIC TAGS: surface active substance, hydrocarbon, pyrolysis

ABSTRACT: This Author Certificate presents a method for producing nonionogenic surface-active substance such as polyglycol ethyl alkylphenol by reaction of phenol with the hydrocarbon fraction of petroleum-product pyrolysis, and then with hydroxyethyl processing. To expand the raw-material base and to improve the product, the phenol is subjected to alkylation by a hydrocarbon fraction of petroleum-product pyrolysis consisting of 2-5% (by volume) of pentane, 29-35% isobutylene, 32-42% butylene, 12-20% divinyl, 2-4% butane, and 1-2% of higher, with subsequent hydroxyethyl processing by the standard method.

ASSOCIATION: none

Card 1/2

131 AND 132 (1955)		PROCESS AND PROPERTIES INDEX	
B-L		B-J. 2	
<p>Removal of hydrogen sulphide from gas by oxidation by active charcoal. S. KARAKHOVSKI and K. PRIGOR (J. Chem. Ind. Russ., 1936, 17, 815-821).— 20% steam O_2 is added to water-gas than is required for the reaction $2H_2S + O_2 \rightarrow 2H_2O + 2S$; NH_3 is added (15% of the wt. of H_2S present), and the mixture is passed through active O (from coke) at a rate and temp. ensuring a temp. of $< 115-120^\circ$ in the reaction zone. The activity of this catalyst in the following layers is lowered by adsorption of H_2O, but this distils off as the reaction front gradually proceeds through the whole layer of catalyst. The catalyst is reactivated by extraction with 5-10% aq. $(NH_4)_2S$ followed by steam, and the solvent is regenerated by distillation, leaving a residue of S. R. T.</p>			
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION			
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PROCESSES AND PROPERTIES INDEX																																																																													
<div style="display: flex; justify-content: space-between;"> ca 10 </div> <p>Production of acetic anhydride from acetylene. S. N. Kozlovskii and K. B. Piskunov. Org. Chem. Ind. (U. S. S. R.) 1, 193-202(1956).—Results of lab. expts. and a scheme for com. production of Ac_2O by intermediate</p> <p>condensation of C_2H_2 and AcOH with HgO as catalyst to ethylene diacetate are based on Ger. pat. 271,381 and 465,563. Chas. Blanc</p>																																																																													
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ca

Production of oxalic acid from acetylene. S. N. Kazemovskii. *Org. Chem. Ind. (U. S. S. R.)* 2, 3-9 (1934).—In the lab. production by the method of Ger. pat. 372,119 a max. of 80% (CO₂H)₂ was obtained by com-
bust. of C₂H₂ at a rate of 2 l./hr. into 1 l. of 43-63% HNO₃ (contg. 25-30 g. Hg(NO₃)₂ at 35°. A tentative scheme for a semicon. production of (CO₂H)₂ by the same method with strengthening of the spent HNO₃ with N oxides is illustrated and described. A mixt. of synthetic and waste N oxides is used. Twenty references. Chas. Blanc

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

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CA

Methods for determining organic sulfur compounds in hydrogen and gas mixtures. S. N. Kazarnovskii, I. N. Efremova and R. S. Oks. *Zavodskaya Lab.* 5, 437-31 (1936).—Various oxidation and reduction methods for detg. impurities of S compds. in H and H-gas mixtu. are discussed critically. Chas. Blane

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

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Determination of acetylene in liquid oxygen. S. N. Kazarnovskii, *Antroprene Delo* 1936, No. 10, 16-17.
--A crit. review with 3 references. A. A. Podgorny

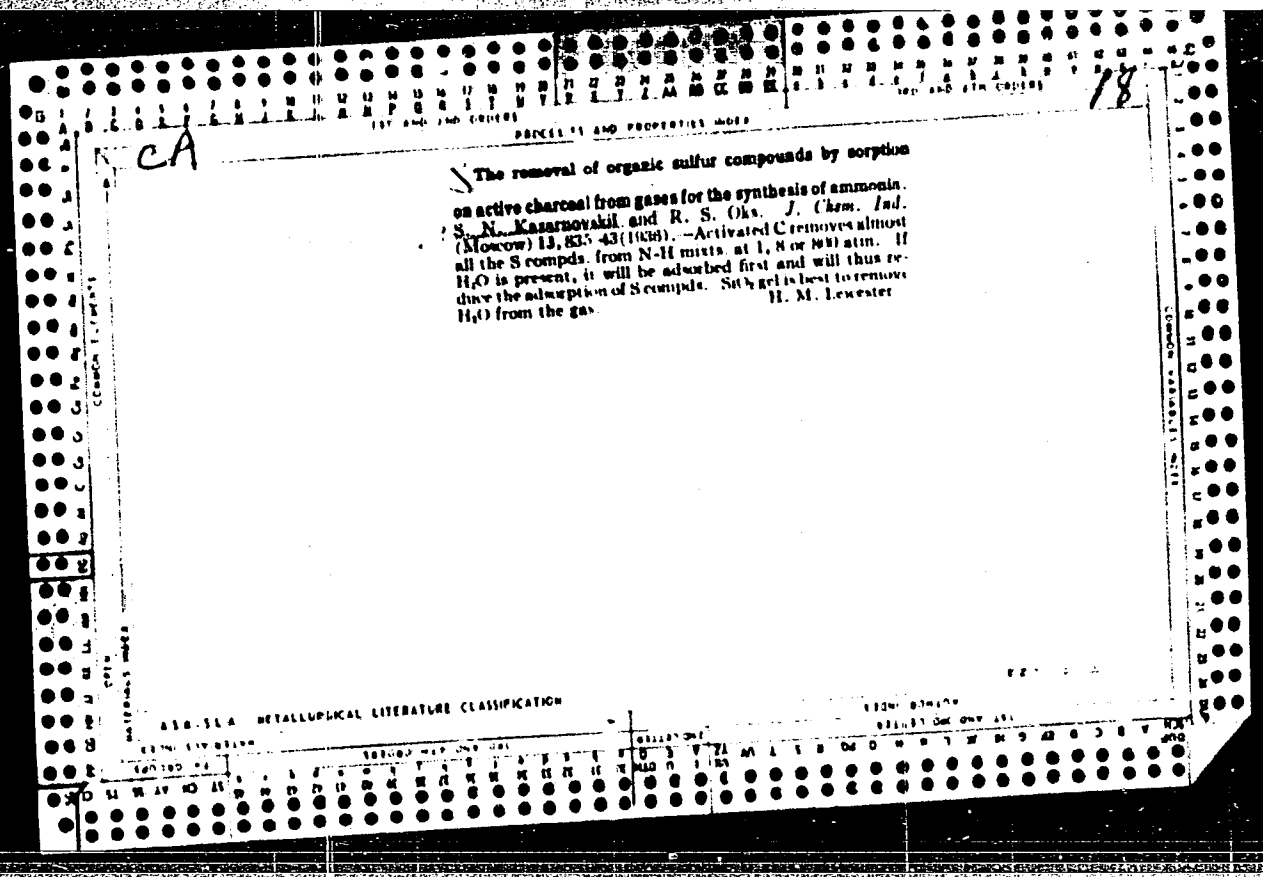
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

A nickel catalyst for the purification of nitrogen-nitrogen mixtures containing carbon monoxide. S. N. Kazanovskii and T. N. Efremova. *J. Chem. Ind. (Moscow)* 13, 216-20 (1936).—Ni-Al and Ni-Al-Mn catalysts for converting CO into CH₄ are more efficient and less easily poisoned by S compds. than Ni alone. They work best at 350-400°, 8 atm. and not too rapid a flow of gas. H. M. Leicester

ASTM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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13-1-8

ACETYLENE IN AIR-COMPRESSION AND -DISTILLATION PLANTS. S. N. KARABOTSKI and A. A. GOLUBEV (J. Chem. Ind. Russ., 1937, 14, 251-257).—Presence of C_2H_2 in liquid air or O_2 is due to contamination of the air or to use of unsuitable lubricants in the compression units. R. T.

18

The purification of nitrogen-hydrogen mixtures from carbon monoxide by selective oxidation. S. Katsunovskii, V. Borshchevskii and D. Kostin. *J. Chem. Ind. (U. S. S. R.)* 13, No. 4, 41-6 (1938).--Hopcalite at 100° converts 93-9% of the CO in a N-H mixt. contg. 0.3-1.0% CO into CO₂ in the presence of 100% excess of O₂. FeCl₃, even in the presence of CrCl₃ and CeCl₃, is less effective. S compounds poison the catalyst. H. M. L.

CA 26

Painting passenger locomotives. S. N. Kazantsovskii. *Aviats. Mashinostroenie*, 1939, No 8, 0 12; *Khim. Tekhnol. Zhur.* 1940, No 3, 0 7. --K, describes a no. of tech. requirements and gives a scheme of the tech. process for painting passenger locomotives which have special requirements in elasticity, thermal stability, adhesion and mech. strength. W. R. Henn

ASIA SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES ACES

CA

Production of synthetic acetic acid. S. N. Kazarnov.
Sov. Ukr. Chem. Ind. (U. S. S. R.) 7, 204 (1940).
A review of the literature with 31 references dealing with the
synthesis of HOAc from alk., C_2H_4 , CH_4 , MeOH and acetone
through ketene, and also the prepn. of derivs. of HOAc.
B. Z. Kamich

ASAC 15.4 METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES ACES

Synthesis of acetic acid from acetylene. S. A. Aronov.
Doklady Akad. Nauk SSSR, 1967, No. 10, p. 1040.
A review of the present status of the preparation of HOAc
by hydration of C₂H₂ to AcH and oxidation to HOAc.
The present experience accumulated abroad is considered
sufficient to start the development of such plants in the
Soviet Union. H. Z. Kamich.

KAZARNOVSKI, S. N.

Author: Kazarnovskii, S. N.

Title: Synthetic acetic acid.
Sinteticheskaya ukusnaya kislota.
96 pp.

City: Moscow

Date: 1946

Subject: Acetic acid.

Available: Library of Congress, Call No: TP248A18K3

Source: Lib. of Cong. Auth. Cat., 1948

Gives information on the synthesis of acetic acid, with inclusion of diagrams of various apparatuses used and flow charts. Discusses application of method to commercial acetic production.

KOLOTUKHIN, I.N.; KUZNETSOV, V.G.; KAZARNOVSKIY, S.N.; TSAREGRADSKIY,
V.A.; PINCHUK, G.A., redaktor; VERINA, G.P., tekhnicheskii redak-
tor

[Technology of lubricating and protective materials] Tekhnologiya
smazochnykh i zashchitnykh materialov. Moskva, Gos. transportnoe
zhelez-dor. izd-vo, 1952, 235 p. [Microfilm]. (MIRA 8:7)
(Lubrication and lubricants) (Corrosion and anticorrosives)
(Finishes and finishing)

VEDENKIN, S.G., professor; KUZNETSOV, V.G., inzhener; KAZARNOVSKIY, S.N.,
inzhener.

Improving lacquers and paints. Standartizatsiya no.2:12-17 Mr-Ap '54.
(MLRA 7:6)

1. Tsentral'nyy nauchno-issledovatel'skiy institut Ministerstva putey
soobshcheniya. (Paint materials--Standards)

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USSR/Analysis of Organic Substances.

G-3

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 19739

Author : S.N. Kazarnovskiy, C.I. Lebelev.

Inst : Gorki Polytechnical Institute

Title : Quantitative Determination of Melamine and Cyanuric Acid.

Orig Pub : Tr. Gor'dovsk. politekh. in-ta, 1955, 11, No 3, 52-55.

Abstract : A sample of about 0.1 g of melamine (I) is dissolved while heated in 100 ml of water, cooled and the insoluble substances are filtered off. The solution is heated nearly to the boiling point, 100 ml of the reagent (1.5 g of cyanuric acid (II) in 1 liter of water) are added, and all is cooled; the precipitate is filtered off with a glass filter No 3, or 4, washed with a diluted solution (25 ml) of II (0.3 g of II per 1 liter water), dried at 105 to 110°, and the I content (in %) is computed in mixtures with predominant I according to the equation:
$$x = \frac{1}{2}(A + 0.0045A \pm 0.4942 \times 100) : B$$
, where A is the

KAZARNOVSKIY, S. N.

USSR/Analysis of Organic Substances.

G-3

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 19700

Author : S.N. Kazarnovskiy, N.I. Moshchanskaya.

Inst : Gorki Polytechnical Institute.

Title : Quantitative Determination of Biguanide.

Orig Pub : Tr. Gor'kovsk. Politekh. in-ta, 1955, 11, No 3, 62-67.

Abstract : A weighed sample of biguanide (I) (0.1 g) is dissolved in 25 to 30 ml of water, dry mannite is added until a 10% solution is obtained (2.5 g), 10 ml of concentrated NH_4OH , 5 drops of the 0.25% solution of indigoermine in 50% alcohol and the 25% KOH solution (drop by drop until the color changes into yellow-green) are added. After that 2 to 4 ml of the reagent (40 g of $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ plus 100 ml. of 7% mannite solution plus 90 ml. of concentrated NH_4OH plus 15 ml of 25% KOH solution) are added, all is shaken and left (in a closed flask) 2 to 3 hours. When the precipitation is completed, the solution over

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ABZARNOVSKY

S.N.

APPROVED FOR RELEASE: 06/13/2000

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KAZARNOVSKIY, S. N.

AUTHORS: Kazarnovskiy, S. N., Hoshchanskaya, N. I. 79-12-43/43

TITLE: On the Formation of the Guanidine Carbonate From Cyanide Guanidine, Ammoniumbicarbonate and Ammonia in an Aqueous Solution (O mekhanizme obrazovaniya karbonata guanidina iz tsianguanidina, bikarbonata ammoniya i ammiaka v vodnom rastvore).

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, Nr 12, pp. 3386-3390 (USSR)

ABSTRACT: The guanidine carbonate is much utilized in the industrial organic synthesis because of its great reactivity. The simplest and cheapest method for its production consists in a heating of the cyano-guanidine together with ammoniumbicarbonate in a concentrated ammonia solution at 126°C at a pressure of 20 - 22 atmospheres. By-products of this reaction are ammeline, ammelide, melamine, and urea. More precise results were not described in publications up to now. The purpose of this investigation was the examination of the kinetics and of the reaction process of the formation of the guanidine carbonate in the temperature range from 100-150°C. The formation of the guanidine possesses an intermediary stage in the formation of bi-guanidine. The reaction kinetics of the formation of

Card 1/3

On the Formation of the Guanidine Carbonate From Cyanide
Guanidine, Ammoniumbicarbonate and Ammonia in an Aqueous
Solution

79-12-43/43

biguanidine are less marked than the kinetics of its transformation into guanidine. The content of guanidine as the final product increases with the duration of heating at a constant temperature, during which process the reaction velocity of the formation of guanidine, however, decreases, which velocity, on the other hand, increases with a rising temperature. The maximum production rate of guanidine is obtained at a heating of four hours duration at 140°C (40 %, computed in relation to the theoretical production rate). Apart from the principal reaction secondary reactions take place, resulting in the production of derivatives of the 1,3,5-triazine, melamine and urea. Within the limits of the synthesis of the enanidine carbonate urea is produced from ammonia and carbon dioxide. There are 1 figure, 1 table, and 17 references, 7 of which are Slavic.

Card 2/3

KAZARNOVSKI, S.N.

Mechanism of the reactions which take place during the reaction of cyanuric acid with ammonia. (S. N. Kazarnovskii and N. I. Kravtchenko. *Zhur. Priklad. Khim.* 30, 4963 (1957).) A study of the kinetics for the reaction of NH_3 with cyanuric acid in the temp. range 250–350° showed that the reaction is accompanied by amination and depolymerization reactions and by the partial destruction of the triazine ring. The products of the amination are the various derivatives of triazine and melamine. The rate of the reaction increases with increasing temperature and is decreased by the rate of formation of the triazine ring. The rate of depolymerization

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Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 8, p 406 (USSR)

AUTHORS: Kazarnovskiy, S.N., Kozlov, V.N.TITLE: An Improved Method for the Production of Isopropyl Alcohol¹

PERIODICAL: Za tekhn. progress (Sovnarkhoz Gor'kovsk. ekon. adm. r-na), 1958, Nr 4, pp 22 - 25

ABSTRACT: An improvement of the method of producing isopropyl alcohol (I) consists in the fact that the hydrolysis of isopropylsulfuric acid (II) is carried out by the action of overheated steam on the product of sulfuric acid hydration of propylene (III), which makes it possible to obtain, after distillation of I with steam, spent sulfuric acid (SSA) of sufficiently high concentration suitable for repeated use on the stage of III absorption (stage of II formation). The method was tested on a usual laboratory, enlarged laboratory and pilot plant installations in apparatus of the column or tower type. As initial semi-finished product the industrial extract was used (solution of II), specific gravity ~ 1.2 , with a total acidity of 46-47.5% and a content of I being 40 - 42%. Under laboratory conditions at a temperature of the overheated steam of 190 - 200°C (140 - 150°C in the re-

Card 1/2

AUTHORS: Kazarnovskiy, S. N., Shvetsova, Z. N. SOV/64-58-6-1/15

TITLE: The Properties and Methods of Production of Melamine (Melamin, yego svoystva i sposoby polucheniya)

PERIODICAL: Khimicheskaya promyshlennost', 1958, Nr 6, pp 325-330 (USSR)

ABSTRACT: In the course of the next few years, the production of melamine will be considerably increased, according to the decisions of the plenary session of the TsK KPSS which was held in May. Melamine is used in the form of the products resulting from its condensation with formaldehyde which are modified by additions of alcohols, castor oil, nitroparaffins and other substances thus improving the properties of the resin and the quality. In the explanation of the properties of melamine it is mentioned that, according to Lemcult (Lemu) (Ref 16), its water solubility is only 0,29 g/l at 15°. The references (Refs 12, 23, 24) are contradictory as to its basic properties. Melamine has three active amino groups and condenses easily with formaldehyde, croton aldehyde, furfural, ethanol and butanol, urea, ethylene glycol, glycerin, mannite, sorbite and other hydrocarbons. The condensation products obtained often show an increased thermal

Card 1/3

The Properties and Methods of Production of Melamine SOV/64-58-6-1/15

stability and mechanical strength, water resistance and good plasticity under pressure and have other properties important to plastics industry. At present, most commonly used are the products resulting from its condensation with melamine, those containing six molecules of formaldehyde called hexamethylol melamine. In connection with the production methods it is also pointed out that the first synthesis was carried out by Liebig (Libikh) (Ref 27) in 1834, and then by Lemoult in 1899. In recent times, particular attention is paid to the synthesis of melamine and urea and to the products of its pyrolysis. The nitrogenous compounds from which melamine is obtained, as well as the correspondent methods of production, may be divided into several groups. Tables explain the way in which this division is carried out. On the basis of patent data and the analyses carried out at the institute called Association three basic methods of the synthesis of melamine from dicyano diamide can be distinguished: 1) under pressure of an inert gas (dry method), 2) in a methanol solution saturated with ammonia (wet method), and 3) in liquid ammonia. These three methods are described and illustrated by schematic representations. Calculations have shown that all three methods are equivalent from the technical and economic point

Card 2/3

The Properties and Methods of Production of Melamine SOV/64-58-6-1/15

of view. There are 4 figures and 57 references, 9 of which are Soviet.

ASSOCIATION: Gor'kovskiy politekhnicheskii institut imeni A. A. Zhdanova
(Gor'kiy Polytechnical Institute imeni A. A. Zhdanov)

Card 3/3

KAZARNOVSKIY, S.N.; MALKINA, N.I.

Mechanism of the reactions taking place during thermal processing of urea under the pressure of generated gas.
Zhur.prikl.khim. 31 no.3:452-458 Mr '58.

(MIRA 11:4)

1.Gor'kovskiy politekhnicheskii institut im. A.A. Zhdanova.
(Urea)

5(4)

SOV/79-29-8-16/81

AUTHORS:

Lebedev, O. L., Antipina, I. V., Kazarnovskiy, S. N.,
Lebedeva, V. V.

TITLE:

Catalytic Oxidation of Cyclohexylamine by Means of Hydrogen
Peroxide Into the Oxime of Cyclohexanone

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2534-2536
(USSR)

ABSTRACT:

In the synthesis of the oxime of cyclohexanone which is used
in the manufacture of caprone, the oxidation of cyclohexylamine
with hydrogen peroxide in the presence of catalysts can be
applied. Cyclohexylamine is easily obtained by hydrogenation
of aniline. The purpose of the present paper was the oxidation
of cyclohexylamine to form the oxime of cyclohexanone by means
of hydrogen peroxide. The following reagents were used: 98%
cyclohexylamine with a boiling point of 133°, obtained by
hydrogenation of aniline; 30% hydrogen peroxide dissolved in
water; ammonium tungstate and ammonium molybdate. The oxime
formed in the reaction was determined colorimetrically (Ref 9).
In the oxidation of cyclohexylamine, a number of catalysts were
used which combine with H_2O_2 : the salts of the uranic, vanadic,

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SOV/79-29-8-16/81

Catalytic Oxidation of Cyclohexylamine by Means of Hydrogen Peroxide Into the Oxime of Cyclohexanone

molybdic and tungstic acid. The first two are not active. Figure 1 presents the results of the oxidation of cyclohexylamine in the presence of the molybdates and tungstates. The ammonium tungstate shows the highest activity in the presence of trilon B. By a catalyst deficiency with respect to H_2O_2 the oxime formation is reduced, on excess catalyst it does not increase. Thus the reaction of the catalyst with H_2O_2 plays an important part in the oxidation. In the process of oxidation the grouping $E-OOH$ (or EOO^-) is the oxidizing agent, in which E represents one of the atoms C, S, W, Mo. Pertungstate seems to be most suitable for the above-mentioned synthesis. The influence exerted by the concentration of trilon B upon the yield of the oxime is shown in figure 2. The experiments showed that trilon B acts as a stabilizer of H_2O_2 in which it suppresses the side reaction, i.e. its decomposition. With an increasing quantity of H_2O_2 , also the yield of the oxime increases up to 58%, but only in the presence of tungstate. On addition of trilon B,

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Catalytic Oxidation of Cyclohexylamine by Means of Hydrogen Peroxide Into the Oxime of Cyclohexanone

SOV/79-29-6-16/6:

the yield increases up to 80% in which case only half of the hydrogen peroxide is needed (Fig 3). There are 3 figures and 13 references, 9 of which are Soviet.

ASSOCIATION: Gor'kovskiy politekhnicheskii institut (Gor'kiy Polytechnic Institute)

SUBMITTED: February 20, 1958

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KACHANOV-3.7

PHASE I BOOK EXPLOITATION

SOV/4775

Kolotukhin, Ivan Nikiforovich, Vasilii Georgiyevich Kuznetsov,
Semen Naumovich Kazarnovskiy, and Vladimir Alekseyevich
Tsaregradskiy

Tekhnologiya smazochnykh i zashchitnykh materialov (Technology of
Lubricants and Protective Materials) 2nd ed., rev. and enl.
Moscow, Transzheldorizdat, 1960. 146 p. 6,000 copies printed.

Ed.: G. A. Pinchuk, Candidate of Technical Sciences; Tech. Ed.:
Ye. N. Bobrova.

PURPOSE: This textbook is intended for use in railroad-trans-
portation tekhnikums and may also be used by workers occupied
in painting and lubricating rolling stock.

COVERAGE: The authors discuss processes involved in the production
of lubricating and protective materials for rolling stock.
Attention is given to questions of the economic utilization of
these materials in train maintenance. The second edition has

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Technology of Lubricants (Cont.)

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undergone considerable revision and is supplemented with material on synthetic paints, various additives for improving lubricating materials, new varnishes and paints, and methods of applying these varnishes and paints. No personalities are mentioned. There are 46 references, all Soviet.

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PART I. TECHNOLOGY OF LUBRICATING MATERIALS	
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KAZARNOVSKIY, S.N., LEBEDEV, O.I.

Continuous method of production of sodium formate
from a solution of sodium hydroxide and carbon monoxide.
Khim.prom. 2:114-115 My '60. (MIRA 13:7)
(Sodium formate) (Sodium hydroxide) (Carbon monoxide)

S/079/60/030/05/48/074
B005/B016

5.3200

AUTHORS: Lebedev, O. L., Kazarnovskiy, S. N.

TITLE: Catalytic Oxidation of Aliphatic Amines With Hydrogen Peroxide

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 5, pp. 1631-1635

TEXT: The authors of the present paper investigated the rules governing the catalytic oxidation of aliphatic amines with hydrogen peroxide in the presence of sodium pertungstate. In dilute aqueous solution this oxidation is a second-order reaction the rate of which is directly proportional to the product of concentrations of amine and sodium pertungstate. The kinetic equation of the oxidation reaction is given. Table 1 shows the influence exercised by a change of concentrations of sodium pertungstate, amine and hydrogen peroxide upon the rate of oxidation of some amines. Fig. 2 shows the interrelation between the rate constant of oxidation and the number of hydrogen atoms bound to the amine nitrogen. The rate of oxidation of all aliphatic amines (including ammonia) is determined by two factors: the affinity of the nitrogen atom

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Catalytic Oxidation of Aliphatic Amines
With Hydrogen PeroxideS/079/60/030/05/48/074
B005/B016

to the oxygen atom of the peroxide, and steric hindrances of the access of the oxidizing agent to the nitrogen atom. The former of these factors is determined by the number of hydrogen atoms linked to nitrogen. The more hydrogen is bound, the more slowly proceeds the oxidation. Tertiary amines are, therefore, oxidized most quickly, ammonia most slowly. On oxidation of tertiary amines, however, steric hindrances occur which play a role especially in spatially large or highly-branched substituents. In the above-mentioned oxidation of aliphatic amines, compounds are formed which contain one oxygen atom bound to nitrogen: amine oxides, hydroxylamines, and oximes. Ammonium ions which possess no free electron pair are not oxidized. It may be concluded from the fact that different substances such as $N(CH_3)_3$, NH_3 , and NO_2^- , the only common property of which is a free electron pair, are oxidized by hydrogen peroxide in the presence of sodium pertungstate, that the oxidation takes place on this free electron pair. In this connection, primarily an addition product of the type of an amine oxide is formed. In the case of ammonia and of primary and secondary amines, isomerization of this amine oxide occurs, and the corresponding hydroxylamine is formed (Ref. 6). The authors investigated the influence of some functional groups in the amine molecule

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Catalytic Oxidation of Aliphatic Amines
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upon the rate of oxidation. Carbonyl- and carbimide groups which are directly bound to the amino group suppress the oxidation almost completely. Amino acids are oxidized only if the carboxyl group is bound by ly ϵ . A hydroxyl- or amino group in β -position to the amino group increases the rate of oxidation. In an experimental part, the procedure of the investigations is described. Table 2 gives the rate constants of the oxidation with hydrogen peroxide for a number of amines. 31 amines were oxidized in aqueous solution in the presence of sodium pertungstate, 9 amines in aqueous-alcoholic solution in the presence of sodium pertungstate, 5 amines in aqueous solution in the presence of sodium permolybdate, 5 amines in aqueous solution without a catalyst, and 2 amines in aqueous-alcoholic solution without a catalyst. There are 3 figures, 2 tables, and 7 references, 4 of which are Soviet. 4

ASSOCIATION: Gor'kovskiy politekhnicheskij institut (Gor'kiy Polytechnic
Institute)

SUBMITTED: February 3, 1959

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LEBEDOV, O.L.; KAZARNOVSKIY, S.N.

Oxidation of amines with pertungstate. Zhur. ob. khim. 30 no.9:
3105-3107 S '60. (MIRA 13:9)

1. Gor'kovskiy politekhnicheskii institut.
(Pertungstates) (Oxidation) (Amines)

S/064/61/000/011/003/007
B110/B101

AUTHORS: Sanina, N. L., Kogan, P. S., Kazarnovskiy, S. N.

TITLE: Selective hydrogenation of acetylene compounds in the
butylene - divinyl fraction of pyrolysis gases from petroleum
products

PERIODICAL: Khimicheskaya promyshlennost', no. 11, 1961, 60 - 62

TEXT: The conditions for a continuous selective hydrogenation of acetylene
hydrocarbons contained in the industrial butylene - divinyl fraction (C_4)
of pyrolysis gases from petroleum products on a stable Ni catalyst were
studied. The authors used electrolytic hydrogen and gas containing
43 - 83 mg/m³ of H_2S and 130 - 200 mg/m³ of CO_2 (% by volume) which con-
sisted of: n-butylene 32 - 42, isobutylene 29 - 35, divinyl 10 - 17,
propylene 0.5 - 5, C_5 and higher hydrocarbons 8 - 11, acetylene compounds
0.04 - 0.14, and a M - kieselguhr catalyst (3.5·3.5 mm tablets). The
temperature in the 200-ml hydrogenation column, a steel tube 700 mm long,
20 mm wide, was -15 to -10°C, that in the collecting vessel was -30 to -20°C.

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Selective hydrogenation of...

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B110/B101

The H_2 pressure was 70 - 100 mm Hg. Before and after hydrogenation, unsaturated compounds in the fraction were determined by 1% Br_2 dissolved in KBr, acetylenes were determined according to C. K. Chavastelon (Compt. rend., 125, 245 (1897)), and divinyl was volume-chromatographically determined. A maximum degree of hydrogenation occurs in the first four reaction hours with a regenerated catalyst since the latter still contains hydrogen absorbed during the reduction. In the second period, the hydrogenation degree remains constant. Then, it decreases since the catalyst is gradually poisoned. With an 83 mg/m^3 content of H_2S in C_4 , acetylenes with increased H_2 concentrations were hydrogenated more intensively than divinyl; butylenes, however, were not hydrogenated. With a fraction containing 0.077 - 0.082% by volume of acetylene derivatives, highest selectivity is reached with a C_4 rate of 0.5 hr^{-1} and a hydrogen - acetylene ratio of 10 - 13 : 1. Hydrogenation of acetylenes reaches ~90%, that of divinyl ~8% which meets requirements of the synthetic rubber industry. With a hydrogen - acetylene ratio of 10 : 1, the degree of

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Selective hydrogenation of...

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B110/B101

fraction $\leq 83 \text{ mg/m}^3$ is admissible under these conditions. There are 4 figures, 1 table, and 17 references: 12 Soviet and 5 non-Soviet. The three references to English-language publications read as follows: G. Hebbard, W. Hunt, US Patent 2359759, 1944; Ch. Welling, H. Hepp, US Patent 2379670, 1945; T. Beuer, US Patent 2391004, 1945. ✓

Card 4/4

KAZARNOVSKIY, S.N., inzh.

New varnish paints for the rolling stock and prospects of their
application. Trudy TSNII MPS no.208:4-24 '61. (MIRA 14:5)
(Varnish and varnishing)
(Railroads--Rolling stock--Painting)

KAZARNOVSKIY, S.N., inzh.; SKALINA, G.M., inzh.

Weather resistance of varnish coatings. Trudy TSNII MPS no.208:25-65
'61. (MIRA 14:5)

(Varnish and varnishing)

(Protective coatings)

(~~Railroads~~—Equipment and supplies)

KAZARNOVSKIY, S.N., inzh.

Metal corrosion of refrigerator cars and its control. Trudy
TSNII MPS no.208:66-98 '61. (MIRA 14:5)
(Corrosion and anticorrosives)
(Refrigerator cars—Painting)

KAZARNOVSKIY, S.N., inzh.; ZAYTSEVA, S.M., inzh.

Water-emulsion paints for the rolling stock. Trudy TSNII MPS
no.208:130-158 '61. (MIRA 14:5)
(Railroads—Rolling stock--Painting)
(latex)

KAZARNOVSKIY, S.N., inzh.

Surface painting in the electric field. Trudy TSNII MPS no.208:181-
205 '61. (MIRA 14:5)

(Spray painting, Electrostatic)

MALKINA, N.I.; KAZARNOVSKIY, S.N.

Synthesis of cyanuric acid from urea. Zhur.prikl.khim. 34 no.7:
1583-1587 J1 '61. (MIRA 14:7)

1. Gor'kovskiy politekhnicheskii institut imeni A.A.Zhdanova.
(Cyanuric acid) (Urea)

KAZARNOVSKIY, S.N.; SPASSKAYA, R.I.

Production of guanadine salts from urea and ammonium salts in
the presence of silica gel. Zhur.prikl.khim, 34 no.9:2079-2084
S '61. (MIRA 14:9)

(Guanidine) (Urea) (Ammonium salts)

SANINA, N.L.; KOGAN, P.S.; KAZARNOVSKIY, S.N.

Selective hydrogenation of acetylenic compounds in the butylene-
bivinyll fraction of gases from the pyrolysis of petroleum products.
Khim, prom. no. 11: 802-804 N '61. (MIRA 15:1)
(Butadiene) (Hydrogenation)
(Petroleum products)

SUBBOTIN, A.I.; KOGAN, P.S.; KAZARNOVSKIY, S.N.

Pyrolysis of the butylene fraction in the presence of oxygen.
Khim.i tekhn.topl.i masel 7 no.8:1-6 Ag '62. (MIRA 15:8)

1. Gor'kovskiy politekhnicheskii institut im. Zhdanova.
(Hydrocarbons) (Pyrolysis) (Butene)

S/081/62/000/024/008/052
B117/B186

AUTHORS: Subbotin, A. I., Kogan, P. S., Kazarnovskiy, S. N.

TITLE: High-temperature pyrolysis of butane - butylene fraction for the simultaneous production of acetylene and ethylene

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24 (II), 1962, 723, abstract 24M202 (Gaz. prom-st', no. 6, 1962, 49 - 53)

TEXT: Pyrolysis of commercial butane - butylene fraction separated from gases obtained by pyrolysis of light petroleum products was conducted at a lab plant, using a quartz tube of 2 - 2.5 mm diameter as a reaction vessel. Pyrolysis was conducted at 1050, 1200, 1300, and 1400°C and at a pressure of 60 - 180 mm Hg in the presence of O₂ (volume ratio O₂ : fraction = 0.1 - 0.2). The fraction was diluted (2:1) with electrolytic H₂, not used up during the pyrolysis, to reduce the formation of carbon black and tar. Results: The optimum time during which the gas was kept in the reaction zone and which yielded a maximum amount of C₂H₂ (I) was found to be closely related with specific pyrolysis temperatures. At the Card 1/2

High-temperature pyrolysis of ...

S/081/62/000/024/008/052
B117/B186

above pyrolysis temperatures, C_2H_4 (II) forms sooner than (I); and a maximum amount of (II) is reached after a shorter time of contact than required for maximum yields of (I). If the contact time exceeds the optimum for (II), its concentration decreases, the content of (I) in the pyrolysis gas increasing simultaneously. The maximum yield of (I) was 59.2 % by volume, and the total yield of (I) and (II) was 79.4 % by volume, both obtained from the fraction which was passed through at 1400°C and stayed in the reaction zone for 0.0013 sec. Thereby, the content of (I) in the pyrolysis gas was 15.6 % by volume and that of (II) was 5.3 %. [Abstracter's note: Complete translation.]

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KOGAN, P.S.; SANINA, N.L.; KAZARNOVSKIY, S.N.; Prinimali uchastiye:
SEDOV, M.P.; KVASOV, A.A.

Removal of acetylenic compounds from the butylene-bivinyll
fraction of gases of petroleum product pyrolysis by the
methode of selective hydrogenation. Khim.prom. no.10:717-719
0 '62.

(MIRA 15:12)

(Olefins)

(Acetylene compounds)
(Petroleum—Refining)

BR

ACCESSION NR: AT4010610

S/3051/63/000/000/0054/0060

AUTHOR: Sanina, N. L.; Kogan, P. S.; Kazarnovskiy, S. N.

TITLE: Hydrogenation of acetylenic compounds and divinyl in the butylene-divinyl fraction of the pyrolytic gases from petroleum products

SOURCE: Kataliticheskiye reaktsii v zhidkoy faze. Trudy* Vsesoyuznoy konferentsii. Alma-Ata, 1963, 54-60

TOPIC TAGS: hydrogenation, catalytic hydrogenation, acetylene, divinyl, pyrolysis, pyrolytic gas, petroleum pyrolysis, hydrogen sulfide, nickel kieselguhr hydrogenation catalyst

ABSTRACT: Using a Ni-kieselguhr catalyst, the authors studied the hydrogenation of the liquid C_4 fraction of the gases from the pyrolysis of petroleum products, containing 61-77% butylene, 10-17% divinyl, 8-16% C_3-C_5 and higher hydrocarbons and 0.14% acetylenic compounds by volume, in order to determine the effect of the flow rate, hydrogen concentration, duration of service of the catalyst, and admixtures of H_2S (43-83 mg/m³) and CO_2 (130-200 mg/m³) on the selectivity and vigor of the hydrogenation of acetylenic compounds and divinyl. Hydrogenation was carried out by the flow method, either under laboratory conditions or on a pilot plant scale. The results showed that the degree of hydrogenation of acetylenic compounds

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ACCESSION NR: AT4010610

increased with the relative volumes of hydrogen and substrate, while the hydrogenation of divinyl remained unchanged; depending on the flow rate, up to 90% of the acetylenes and 8% of the divinyl present in the C_4 fraction underwent hydrogenation. The presence of 83 mg/m³ of H_2S was found to reduce the percentage of the acetylenic compounds hydrogenated to 38% after 11.5 hours of operation, but the percentage was increased rapidly by rejuvenation of the catalyst with hydrogen. The yield of hydrogenated acetylenes was not affected when hydrogen was replaced by a methane-hydrogen mixture. In a more detailed study of the mechanism of hydrogenation of mixtures of divinyl and vinylacetylene, the authors studied the hydrogenation of 88% divinyl and 12% n-butylenes in the presence of nickel-kieselguhr and determined the potential of the catalyst along with the kinetics and selectivity of hydrogenation. The catalyst potential was found to vary markedly, but analysis of the products showed preferential hydrogenation of vinylacetylene in the presence of a large excess of divinyl. Orig. art. has: 4 figures.

ASSOCIATION: Gor'kovskiy politekhnicheskij Institut (Gor'kiy Polytechnic Institute)

SUBMITTED: 00

DATE ACQ: 25Jan64

ENCL: 00

SUB CODE: CH

NO REF SOV: 008

OTHER: 005

Card 2/2